

REMARKS

A Request for Continued Examination is being filed concurrently herewith, and therefore, entry of this Amendment is respectfully requested.

Applicants request a personal interview with the Examiner prior to the first Office Action after RCE in accordance with M.P.E.P. § 706.07(b)(paragraph 4).

The Examiner respectfully is requested to contact the undersigned attorney at the Examiner's earliest convenience to schedule the interview.

Applicant concurrently files herewith a petition and fee for a three-month extension of time.

Claims 1-28 and 35-39 are all the claims presently pending in the application. Claims 35, 38, and 39 have been amended to define more clearly the features of the present invention. Claims 29-34 have been canceled without prejudice or disclaimer as being directed to a non-elected invention.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 35-37 stand rejected under 35 U.S.C. § 112, second paragraph, and claims 1-28 and 35-39 stand rejected on prior art grounds.

As for the prior art rejections, claims 1-28 and 38-39 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Kagami, et al. (Japanese Patent No. 2000-347043; hereinafter "Kagami") and under 35 U.S.C. § 102(e) as being anticipated by U.S. Application No. 09/534,458 (now U.S. Patent No. 6,703,188 to Kagami).

Claims 1-28 and 38-39 also stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kagami or U.S. Application No. 09/534,458, in view of *newly cited* Kawabata, et al. (U.S. Patent No. 5,665,494; hereinafter "Kawabata"). Claims 35-37 stand rejected under 35

U.S.C. § 103(a) as being unpatentable over JP 08-320422, in view of Anderson (U.S. Patent No. 4,969,702) and Kagami.

Claims 1-28 and 38-39 now stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-8 and 11 of U.S. Application No. 09/534,458, in view of *newly cited* Houlihan, et al. (U.S. Patent No. 6,204,304; hereinafter "Houlihan") and Kawabata.

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

Applicants' invention is directed to a method for manufacturing an optical transmission device which includes mixing a first photosetting resin comprising a first photopolymerization initiator and a first monomer or oligomer to be polymerized in a first polymerization type by the first photopolymerization initiator, and a second photosetting resin comprising a second photopolymerization initiator and a second monomer or oligomer to be polymerized in a second polymerization type that is different from the first polymerization type by the second photopolymerization initiator.

The method includes forming a core portion of the optical transmission device by hardening the first photosetting resin by making a first irradiation that activates the first photopolymerization initiator but does not activate the second photopolymerization initiator; and forming a clad portion of the optical transmission device by hardening both the first photosetting resin and the second photosetting resin by making a second irradiation that activates both the first and second photopolymerization initiators.

In one aspect of the invention, as recited, for example, in independent claim 1, the first irradiation has a wavelength shorter than the longest wavelength required to activate the first photopolymerization and longer than the longest wavelength required to activate the second photopolymerization. In addition, one of the first polymerization type and the second polymerization type includes radical polymerization, and the other includes cationic polymerization.

In another aspect of the invention, as recited for example, in independent claim 15, the first irradiation has an amount of exposure more than the minimum amount of exposure required to harden the first photosetting resin substantially completely and smaller than the maximum amount of exposure not to harden the second photosetting resin completely.

Another aspect of the invention, as defined by, for example, independent claim 35, is directed to a method for forming an optical transmission device within an optical transmission and reception module for transmitting and receiving an optical signal, the optical transmission and reception module having internally a light emitting element for emitting a light beam for communication with a predetermined wavelength and a light receiving element for receiving the light beam. The method includes introducing a light beam of a predetermined wavelength for formation of the optical transmission device into a space area for forming the optical transmission device within the optical transmission and reception module to harden a photosetting resin solution in an optical axis direction, inserting one end of an optical fiber through a light input/output opening of the optical transmission and reception module, and outputting the light beam of predetermined wavelength for communication by emitting light from the light emitting element.

This aspect of the method includes detecting a quantity of output light output to the outside of the transmission and reception module via the optical fiber among the light beam of predetermined wavelength for communication that is output, adjusting a light input/output axis direction of the optical fiber such that the quantity of output light is substantially at maximum; and entering the light beam of predetermined wavelength for formation of the optical transmission device from the other end of the optical fiber into the optical transmission and reception module, while maintaining the adjusted light input/output axis direction of the optical fiber.

Unlike conventional methods, Applicants' invention includes a method of manufacturing an optical transmission device in which one of the first polymerization type and the second polymerization type includes radical polymerization, and the other includes cationic polymerization (as defined, for example, by independent claim 1), or in which the first irradiation

has an amount of exposure more than the minimum amount of exposure required to harden the first photosetting resin substantially completely and smaller than the maximum amount of exposure not to harden the second photosetting resin completely (as defined, for example, by independent claim 15). In addition, Applicants' invention includes a method of forming an optical transmission device within an optical transmission and reception module, the method including introducing a light beam of a predetermined wavelength for formation of the optical transmission device into a space area for forming the optical transmission device within the optical transmission and reception module to harden a photosetting resin solution in an optical axis direction (as defined, for example, by independent claim 35).

These novel features of the invention allow it to fabricate a cylindrical core portion of an optical transmission device more effectively and efficiently than conventional methods (e.g., see specification at page 2, lines 1-7).

II. THE 35 U.S.C. §112, SECOND PARAGRAPH REJECTION

The Examiner maintains that claims 35-37 are indefinite.

Claim 35 is amended as suggested by the Examiner, and therefore, the rejection of claim 35 should be withdrawn.

With respect to claims 38 and 39, Applicants amend claims 38 and 39 to add the terms acrylate, methacrylate, and oxirane, thereby overcoming the rejection of these claims. Applicants note that "oxetane" is a cyclic ether having four atoms in a ring (one oxygen and three carbons) and "oxirane" is a cyclic ether having three atoms in a ring (one oxygen and two carbon).

As for replacing "meta" with -- metha -- in the specification as suggested by the Examiner, Applicants respectfully submit that the language of the original specification is proper, and therefore, the specification has not been amended at this time.

In light of the foregoing, Applicants respectfully request that the Examiner withdraw this rejection.

III. PRIOR ART REJECTIONS

A. The Kagami Reference

The Examiner maintains that Kagami (the Japanese Patent Publication (Kokai) corresponding to U.S. Application No. 09/534,458, now U.S. Patent No. 6,703,188 to Kagami) teaches the claimed invention recited in claims 1-28, 38, and 39.

Applicants respectfully submit, however, that there are elements of the claimed invention that are not disclosed or suggested by Kagami, and therefore, respectfully traverse this rejection.

In the Response to Arguments, the Examiner states that Applicants argument that the selective use of free-radical or cationic polymerization is not taught is “*entirely incorrect and without merit*” (e.g., see Office Action at page 5, last paragraph).

Particularly, the Examiner asserts that Kagami discloses acrylic monomers, which allegedly undergo free radical polymerization, and epoxy monomers, which allegedly undergo cationic polymerization, and that their different spectral sensitivities as shown in Figure 3 are identical to Figure 17 of the instant specification (see Office Action at page 5, last paragraph).

Applicants respectfully disagree with the Examiner’s position.

Applicants submit that Kagami does not specifically disclose, or for that matter suggest, that the acrylic monomers undergo free radical polymerization and the epoxy monomers undergo cationic polymerization. Indeed, the Examiner has not cited any support for such a disclosure.

Therefore, the Examiner seems to be asserting that Kagami inherently discloses these features (that is, that the disclosed acrylic monomers necessarily must undergo free radical polymerization and the disclosed epoxy monomers necessarily must undergo cationic polymerization).

Applicants respectfully submit, however, that Kagami does not inherently disclose or suggest that the disclosed acrylic monomers necessarily must undergo free radical polymerization and the disclosed epoxy monomers necessarily must undergo cationic polymerization.

As mentioned above, Kagami teaches epoxy resin for high refractive photo curable resin and acrylic resin for low refractive curable resin. Kagami does not, however, teach or suggest specifically which kinds of polymerization are caused by photoreaction.

Applicants note that epoxy monomers would not necessarily undergo cationic polymerization. That is, in addition to cationic polymerization, the epoxy resin of Kagami also could undergo anionic polymerization.

Thus, Kagami does not specifically teach or suggest that epoxy is polymerized by cationic polymerization. Indeed, the Examiner has not cited any support in Kagami for such a disclosure.

Therefore, Kagami clearly does not (and cannot) inherently disclose or suggest this feature of the present invention, as claimed.

Further, Applicants note that acrylic resin would generally undergo radical polymerization.

For radical polymerization methods, there is non-intensified polymerization where monomers provide radicals for themselves by photoreaction and they are polymerized. On the other hand, there is intensified polymerization where a photopolymerization initiator is included and the initiator is decomposed to generate radicals by illumination so that monomers are polymerized.

Kagami does not specifically teach how the radical polymerization is caused. Kagami also does not disclose or suggest whether the photopolymerization initiator is included.

In contrast, in the claimed invention, two different kinds of photopolymerization initiators are selectively included to obtain an optical transmission device having a desired condition.

In other words, two different kinds of polymerizations are positively controlled by selection of the photopolymerization initiators.

In comparison, Kagami merely teaches polymerizing two kinds of resins by photoreaction.

Thus, Kagami clearly does not specifically teach or suggest that epoxy is polymerized by cationic polymerization, and indeed, the Examiner has not cited any support in Kagami for such a disclosure.

Therefore, Kagami clearly does not (and cannot) inherently disclose this feature of the present invention.

Accordingly, Kagami does not anticipate, or render obvious, the claimed invention as

defined, for example, by independent claim 1, and Applicants respectfully request that the Examiner withdraw this rejection.

On the other hand, with respect to independent claim 15, the Examiner has not answered any of Applicants' traversal arguments in accordance with M.P.E.P. § 707.07(f).

Therefore, Applicants respectfully reiterate that there are elements of the claimed invention, as defined by independent claim 15, which are not disclosed or suggested by Kagami (i.e., the Kagami JP publication, U.S. application, or U.S. patent).

Particularly, Kagami does not teach or suggest, among other things, *"wherein said first irradiation has an amount of exposure more than the minimum amount of exposure required to harden said first photosetting resin substantially completely and smaller than the maximum amount of exposure not to harden said second photosetting resin completely"*, as recited in independent claim 15.

The claimed invention includes a method of manufacturing an optical transmission device in which the first irradiation has an amount of exposure more than the minimum amount of exposure required to harden the first photosetting resin substantially completely and smaller than the maximum amount of exposure not to harden the second photosetting resin completely (e.g., see specification at page 43, line 5 to page 47, line 8).

Clearly, Kagami does not teach or suggest this novel feature.

Instead, Kagami merely discloses a mixed solution including a second photoresist solution with a hardening start wavelength shorter than the first photoresist solution (Kagami at paragraphs [0007]).

In fact, nowhere does Kagami teach or suggest amounts of irradiation exposure for setting first and second photosetting resins. Certainly, Kagami does not teach or suggest the first irradiation has an amount of exposure more than the minimum amount of exposure required to harden the first photosetting resin substantially completely and smaller than the maximum amount of exposure not to harden the second photosetting resin completely.

Moreover, Applicants respectfully note that the Examiner did not address this feature in the previous or current Office Action, or for that matter, did not respond to Applicants' traversal

arguments. Therefore, presumably the Examiner did not find this feature in the Kagami reference.

For these reasons, Applicants respectfully submit that there are elements of independent claim 15 that clearly are not taught or suggested by Kagami, and accordingly, request that the Examiner withdraw this rejection.

B. The Kawabata Reference

The Examiner alleges that Kagami (JP 2000-347043 or Application No. 09/534,458) would have been combined with newly cited Kawabata to form the claimed invention of claims 1-28, 38, and 39.

However, Applicants respectfully submit that neither Kagami or Kawabata provides any motivation (i.e., a reasonable motivation) for combining these references to arrive at the claimed invention. Moreover, Applicants submit that, even if combined, the combination would not teach or suggest each and every element of the claimed invention, for somewhat similar reasons as those set forth above with respect to Kagami.

C. The JP '422 and Anderson References

The Examiner maintains the rejection of claims 35-37 under 35 U.S.C. § 103(a) as being obvious over JP '422 in view of Anderson and further in view of Kagami.

In responding to Applicants' traversal argument that the Examiner has not provided a reasonable motivation to combine the references, the Examiner states that all of the references are in the field of fiber optics and waveguiding of light, and therefore, seems to take the position that the references merely being in the same field of endeavor is sufficient motivation to establish obviousness.

Applicants respectfully disagree with the Examiner's position.

Applicants submit that the references merely being in the same general field of endeavor clearly is not sufficient motivation, by itself, to establish the obviousness of combining individual elements of the cited references to arrive at the unique combination of elements in the

claimed method for forming an optical transmission device.

That is, merely attempting to identify each of the individual elements of the claims in separate prior art references, and/or identifying that the elements can be combined, is not sufficient to establish obviousness. The Examiner must establish a reasonable motivation in the references, or in the art in general, for doing that which the inventor has done.

In this case, Applicants respectfully submit that the Examiner has not cited any support for the alleged motivation in the cited references for combining these references in the manner claimed and that mere conclusory statements are not sufficient to establish the obviousness of the claimed invention.

Thus, Applicants respectfully reiterate that these references would not have been combined as alleged by the Examiner. Indeed, these references are directed to different problems and solutions.

Specifically, JP '422 is directed to a method of forming a waveguide, whereas Anderson is merely directed to an optical pigtail assembly.

Therefore, these references are completely unrelated, despite being in the general field of fiber optics and waveguiding of light, and no person of ordinary skill in the art would have considered combining these disparate references, absent impermissible hindsight.

Further, the Examiner still has not pointed to any motivation or suggestion in the references to urge the combination as alleged by the Examiner. Indeed, the Examiner merely states that it would have been obvious to improve the refractive index control of the core versus the cladding layer.

We also would argue that, assuming *arguendo* that a person of ordinary skill in the art would have been motivated to combine the references in the alleged manner, the resulting combination still would not disclose or suggest all of the elements of independent claim 35.

For example, JP '422, Anderson, and Kagami, either alone or in combination, discloses or suggests a method for forming an optical transmission device within an optical transmission and reception module, let alone a method which includes:

introducing a light beam of a predetermined wavelength for formation of the optical transmission device into a space area for forming said optical transmission device within said optical transmission and reception module to harden a photosetting resin solution in an optical axis direction; ...

detecting a quantity of output light output to the outside of said transmission and reception module via said optical fiber among said light beam of predetermined wavelength for communication that is output;

adjusting a light input/output axis direction of said optical fiber such that said quantity of output light is substantially at maximum; and

entering a light beam of predetermined wavelength for formation of said optical transmission device from the other end of said optical fiber into said optical transmission and reception module, while maintaining the adjusted light input/output axis direction of said optical fiber

as defined, for example, by independent claim 35 (emphasis added).

Thus, Applicants respectfully submit that any combination of the cited references would not arrive at the novel and unobvious combination of elements recited in independent claim 35.

For the foregoing reasons, Applicants submit that there clearly are elements of the claimed invention which are not disclosed or suggested by the cited references, and therefore, respectfully requests that the Examiner withdraw these rejections and permit these claims to pass to allowance.

IV. PROVISIONAL OBVIOUSNESS-TYPE DOUBLE PATENTING REJECTION

Claims 1-28 stand provisionally rejected under the judicially created doctrine of

obviousness-type double patenting as being unpatentable over claims 1-8 and 11 of the '458 Application in view of newly cited Houlihan and further in view of newly cited Kawabata.

Applicants note that the '458 Application has now issued as U.S. Patent No. 6,703,188.

Applicants respectfully submit that the Examiner erroneously asserts that both Toyota Choo Kenkyusho and Toyoda Gosei Co., Ltd. are divisions of Toyota.

Applicants point out to the Examiner that the present Application is assigned to Toyoda Gosei Co., Ltd., whereas U. S. Application No. 09/534,458 (now U.S. Patent No. 6,703,188) is assigned to Toyota Choo Kenkyusho, **and not** Toyoda Gosei Co., Ltd.

Thus, these applications are not "commonly assigned" as alleged by the Examiner and there is no double patenting issue in this case.

The Examiner also asserts that the inventors of the '458 Application are all listed as inventors in the present application. Applicants respectfully submit, however, that the Examiner's statement is, in fact, erroneous.

That is, all of the inventors are not in common. Thus, the applications have different inventive entities.

Therefore, the double patenting rejection clearly is improper in this case.

Even assuming arguendo that this rejection should be treated as a rejection under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,703,188 (Kagami) in view of newly cited Houlihan and further in view of newly cited Kawabata, Applicants submit that the claims would be patentable over any combination of the cited references for at least somewhat similar reasons as those set forth above.

V. FORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicant submits that claims 1-28 and 35-39, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

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(NGB.196)

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Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

As mentioned above, a Request for Continued Examination is being filed concurrently herewith, and therefore, entry of this Amendment is respectfully requested.

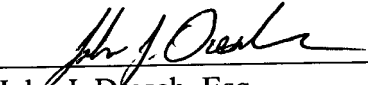
Applicants also request a personal interview with the Examiner prior to the first Office Action after RCE in accordance with M.P.E.P. § 706.07(b)(paragraph 4).

The Examiner respectfully is requested to contact the undersigned attorney at the Examiner's earliest convenience to schedule the interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

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